

**Novel compounds which conduct hydrogen, their preparation and use**

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**Abstract of DE3110571**

Novel mixed crystals of the general formula I

$\text{Me}_{1+x-w}(\text{H}^{<+>} \text{ or } \text{H}_3\text{O}^{<+>})_w\text{M}_{2-1/3x+y}\text{SixZ}_3\text{-xO}_{12-2/3x+2y}$  (I) in which

Me represents a univalent metal,

M represents a transitional element of the IVth group of the Periodic Table of the Elements

Z represents an element of the Vth group of the Periodic Table of the Elements,

w represents a number from 0.1 to  $1 + x$ ,

x represents a number from 0.01 to 3 and

Y represents a number from 0 to 0.5,

can be used as a solid electrolyte conducting protons ( $\text{H}^{<+>}$ ,  $\text{H}_3\text{O}^{<+>}$ ) in an electrochemical cell. They can be prepared by mixing the solid starting components of the mixed crystal in finely powdered form and in the molar proportions required in each case for a particular desired composition, and by calcining them at as high a temperature as possible, but so as to avoid a liquid phase arising, for so long a time, that an  $\text{MO}_2$  peak is no longer visible in the X-ray pattern, the calcining process being interrupted one or more times, if required, in order to finely grind the material once more, followed by exchange, in acidic aqueous solution, of Me against ( $\text{H}^{<+>}$  or  $\text{H}_3\text{O}^{<+>}$ ).

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